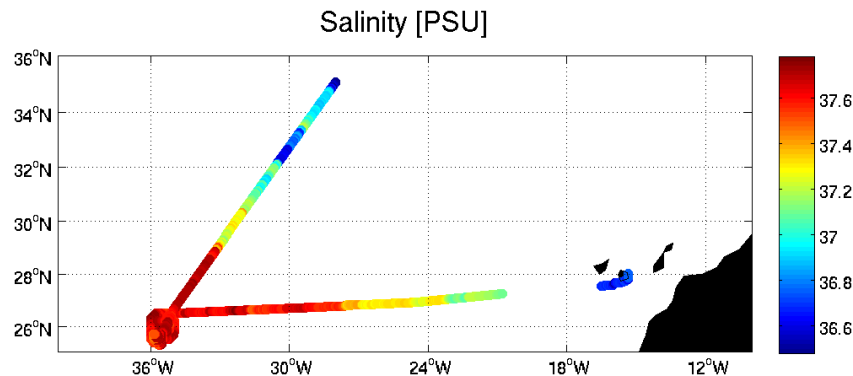


# Strasse cruise 16/08-13/09



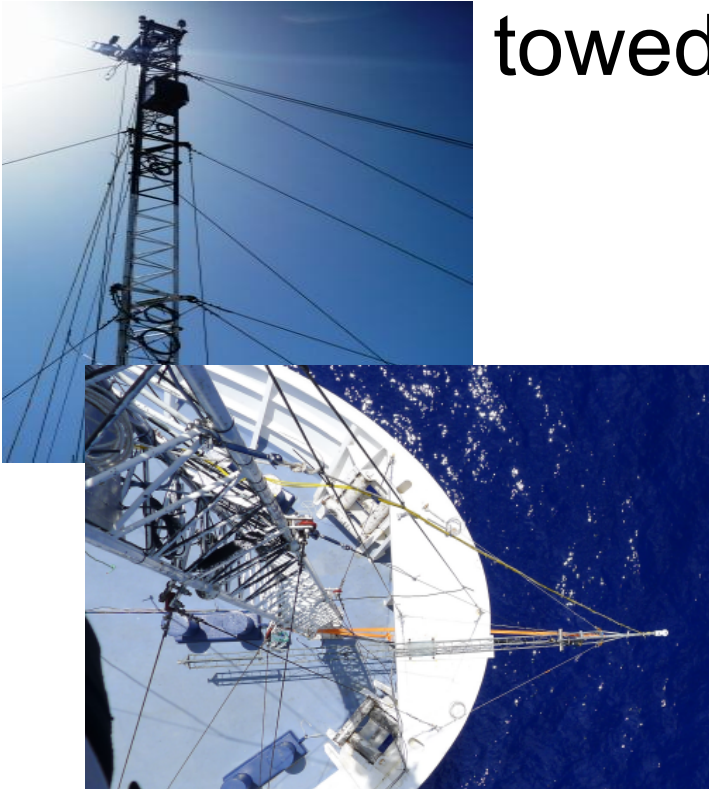
- Measure near-surface salinity/stratification
- Estimate air-sea exchange (evaporation)
- Measure oceanographic variability from hour to week and km to 100 km during stratified season in a region of contrasted properties stirred by eddies



Phys. Oceanography/air-sea team  
G. Reverdin, L. Marié, S. Morisset,  
D. Bourras, K. Salvador, B. Ward,  
G. Sutherland, W. Asher, N. Rascle  
N. Geyskens, C. Caudoux, A. G-B  
O. Menage, S. Prigent,  
F. Le Bars, M. Piedeleu



# ship-board measurements; towed instruments; casts



Meteorological packages;  
Instrumented flux mast  
Aerosol collection;  
Water vapor isotopomers  
Radiosondes; wave obs.  
pCO<sub>2</sub>; O<sub>2</sub>, DIC, pH



Casts: CTD, optical package  
Scamp (microstructure)  
Towed; SSP (0-2m); grabisu  
Scanfish surveys (2m-80m)

# Autonomous instrumentation

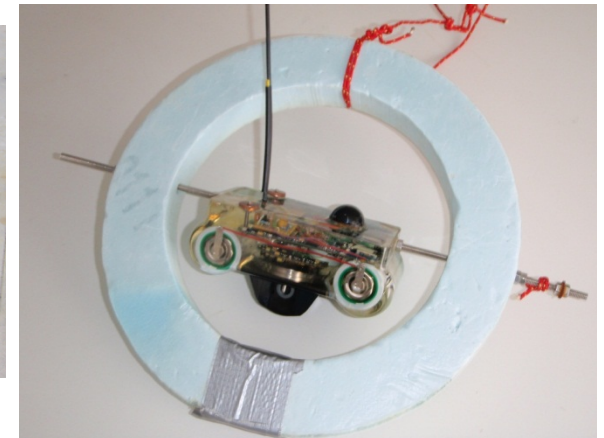
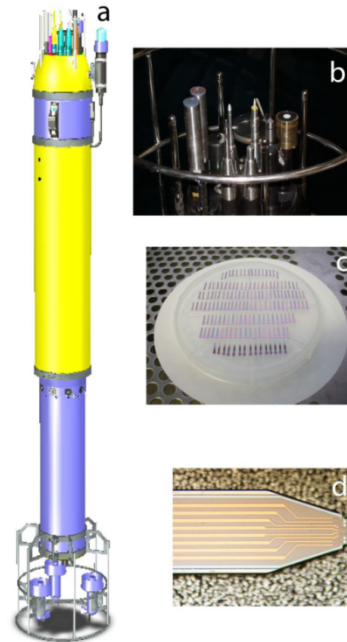
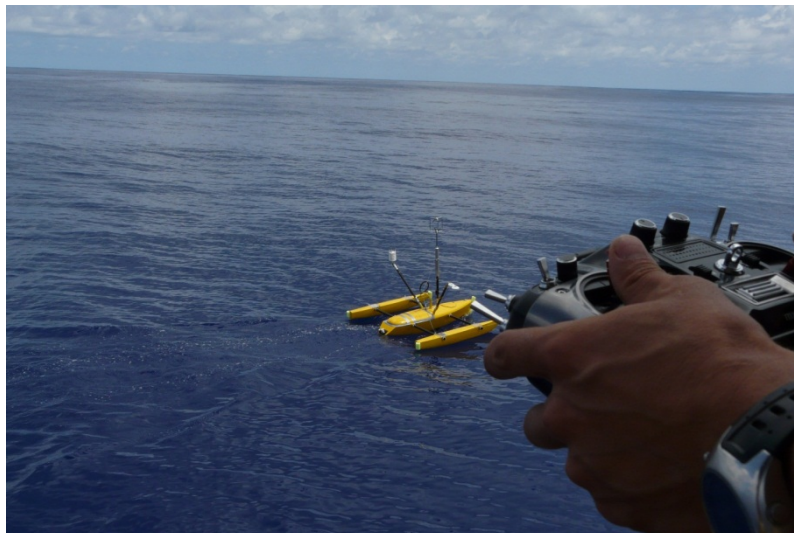
## • Ocarina Vaimos ASIP drifters + 2 gliders

Flux trimaran  
7 hours

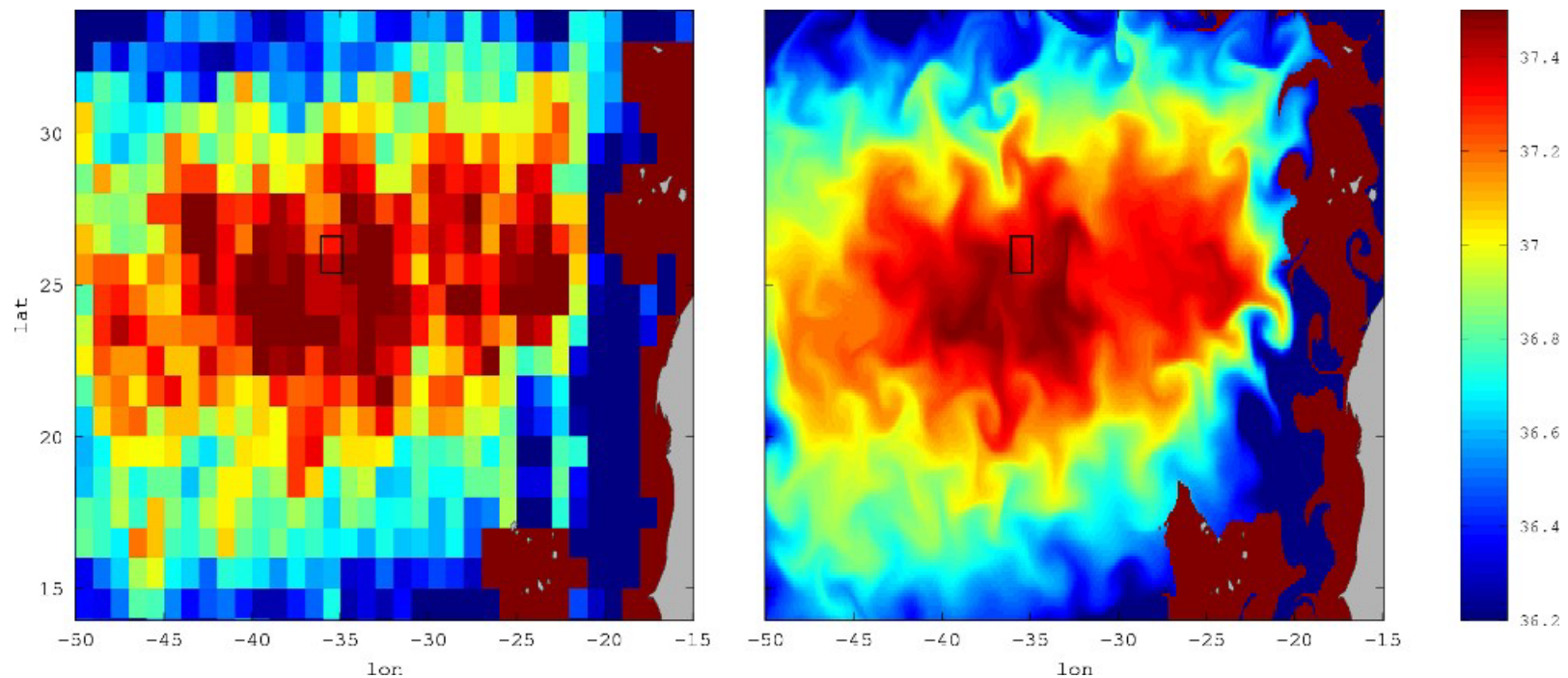
Autonomous  
sailing ship  
>2-3 days

15 SVP drifters  
+ 5 surpact  
15 SVP-S drifter  
1 current profiler drifter

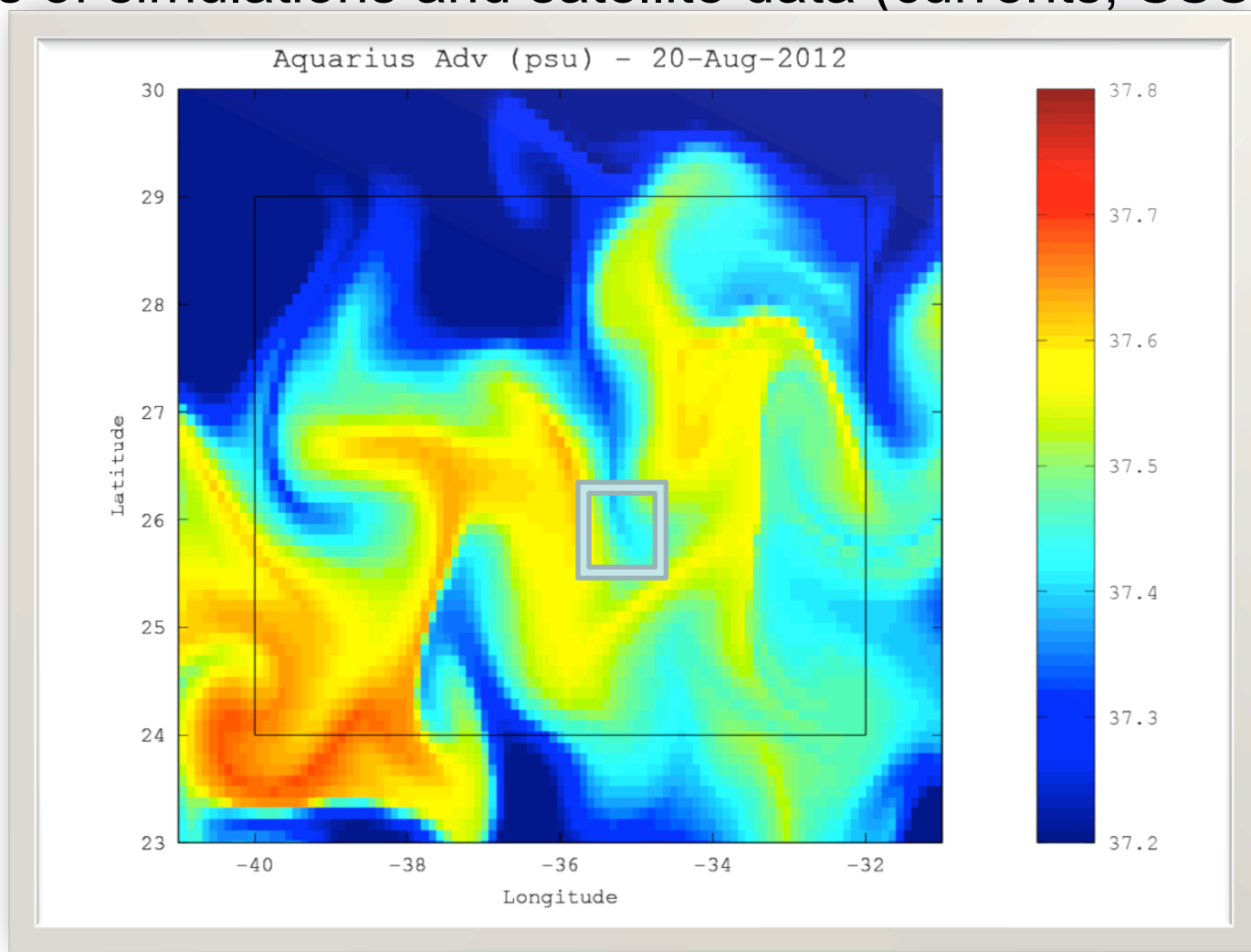
2 slocum gliders:  
Crate for 8 days  
Tenuse for 50 days  
(RV Knorr)



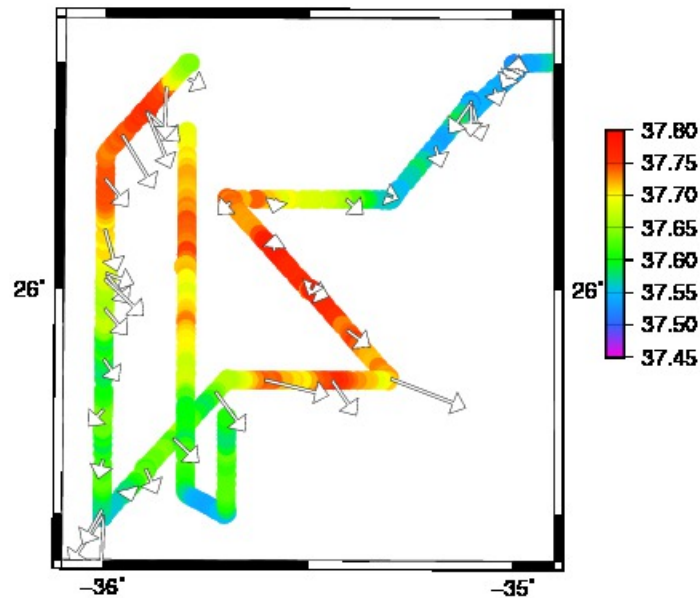
# SMOS maps (left); reconstruction (advection) (right) (Francesco d' Ovidio, Olga Hernandez, F. Nencioli)



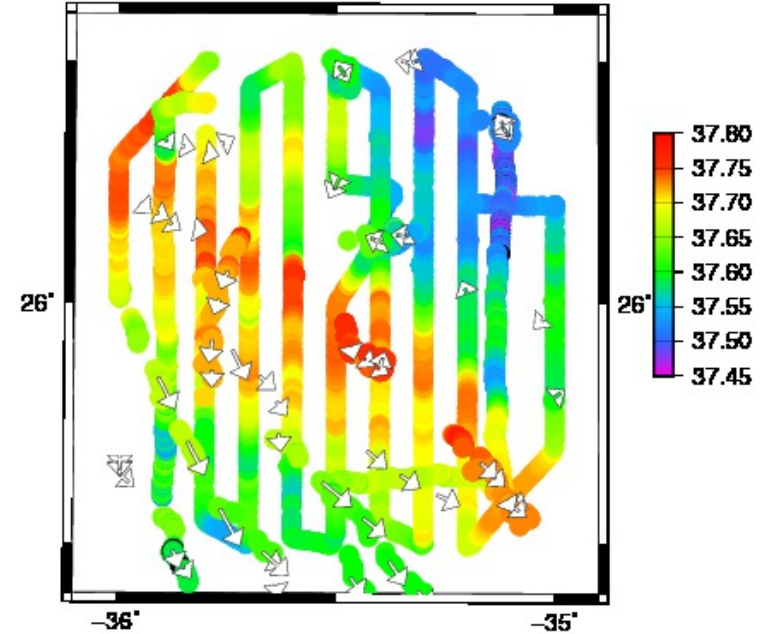
Area selected for fronts/filaments with help of real-time analysis of simulations and satellite data (currents, SSS...)



TSG Thalassa 21–22/08 2012

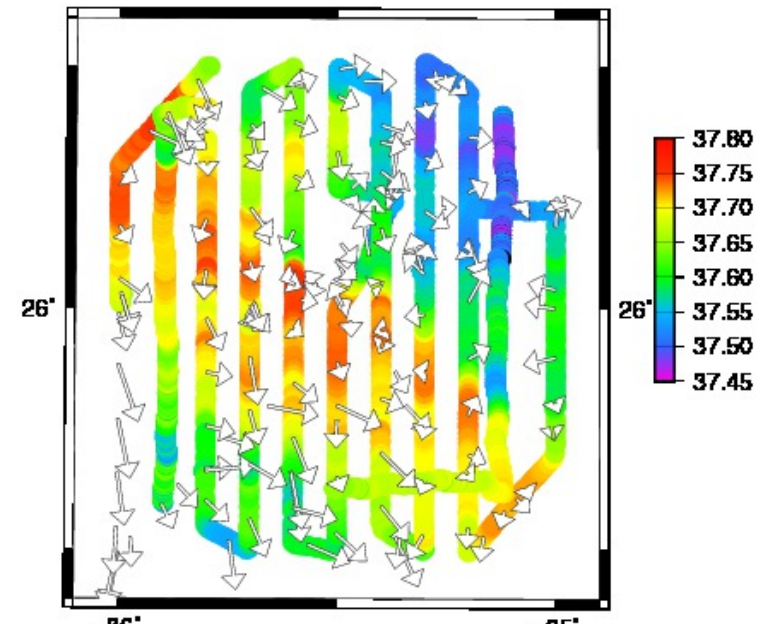


TSG Thalassa 22–25/08 2012



During survey, weak/moderate  
Winds, very stratified

Later, during site surveys  
moderate trade winds;  
deepening of mixed layer





**Four sites** surveyed:

**Duration:** 2.5 - 3.5 days each

5-6 instrumented SVP drifters drogued at 15 m  
(deployed in a patch of 1-2 km)

1 current profiling drifter (drogued 50 m) (sites 2-4)

ASIP for 1-2 days at a time

Ocarina for up to 8 hours

NO Thalassa during day time near SVP drifters  
collecting profiles with CTD, optical package,  
Scamp

During night-time scanfish surveys around the drifters

Site 1: north of high-S filament

Site 2; in high-S filament

Site 3: in front, west of high-S filament

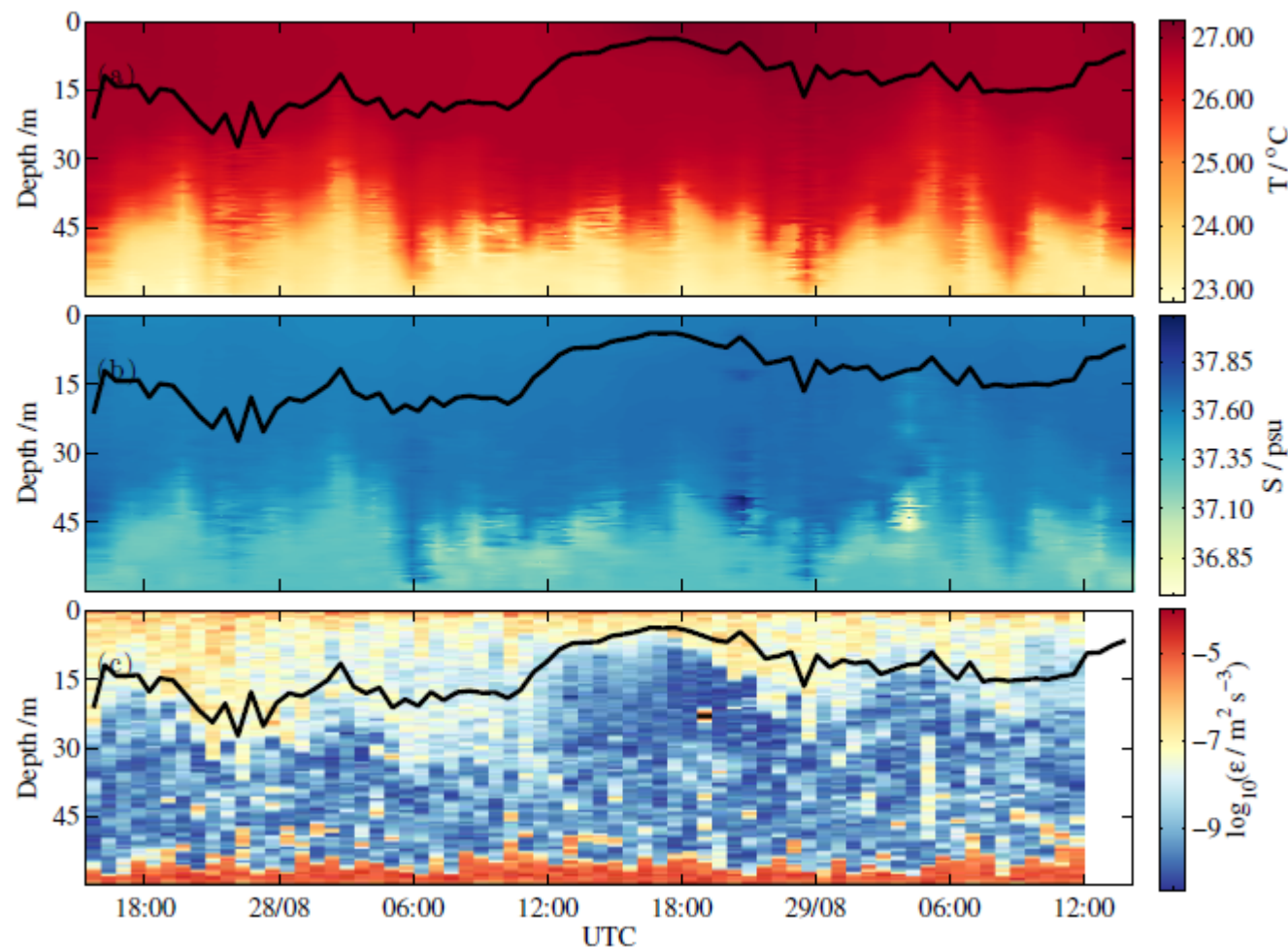
Site 4: in NE, far from fronts

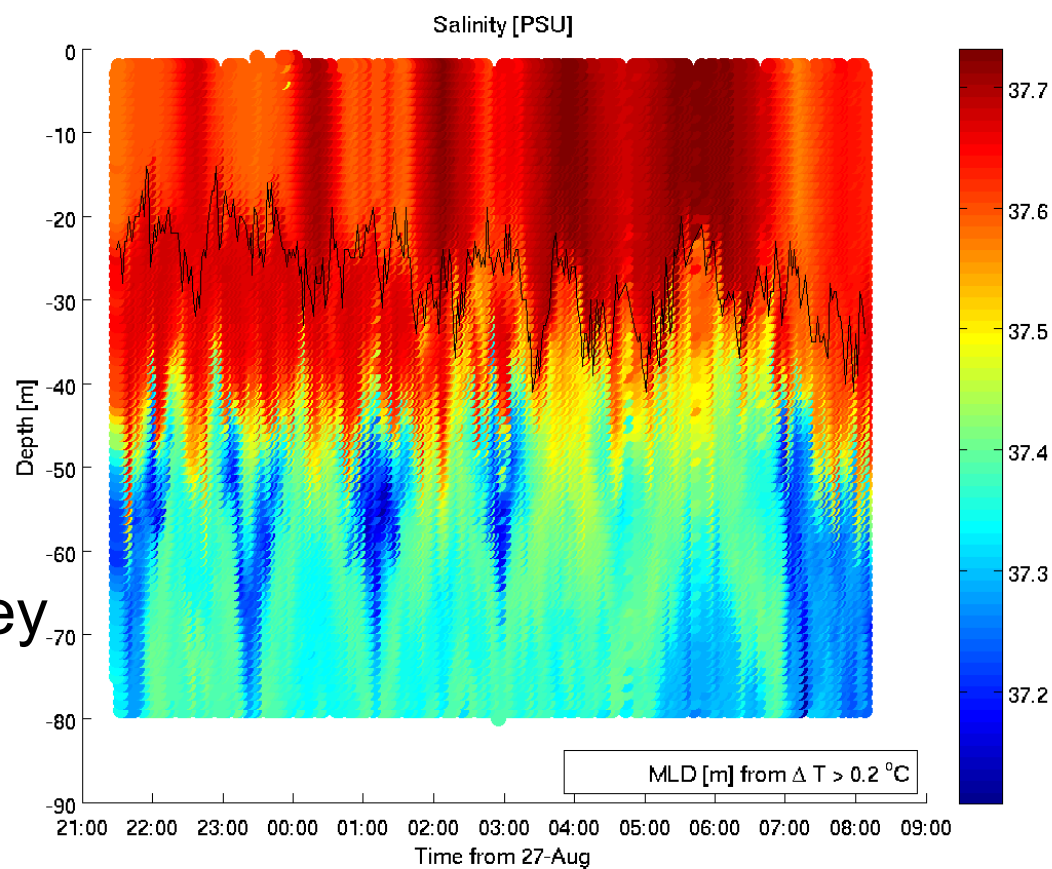
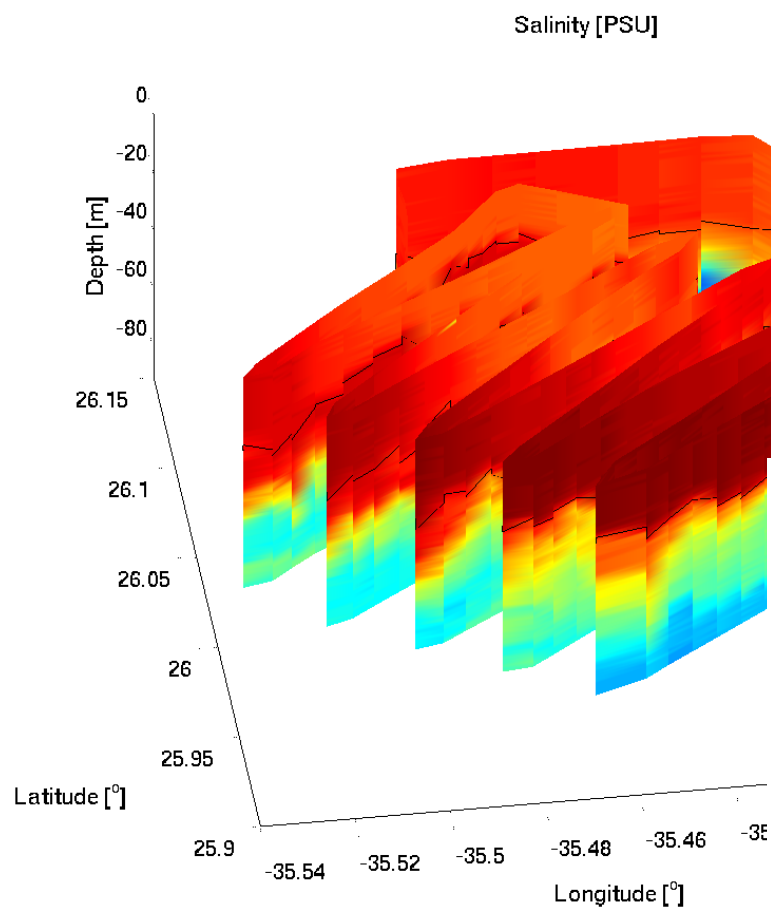


**Site 1:** north of the high-S filament with mixed layer deepening and surface S diminishing slightly (from the drifters)

2-days ASIP deployment during site 1

Mixing penetrates below the very shallow mixed layer (day 1)

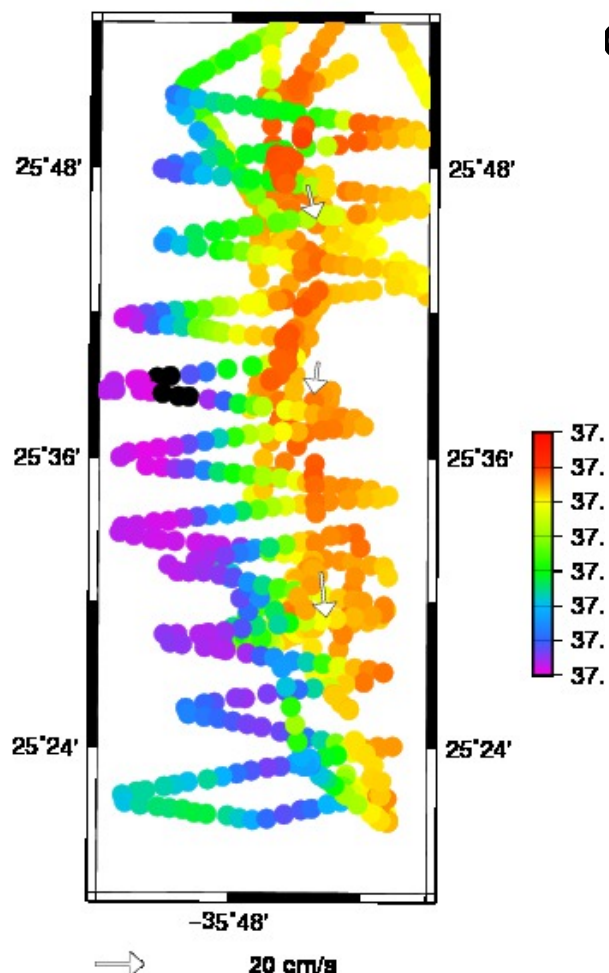




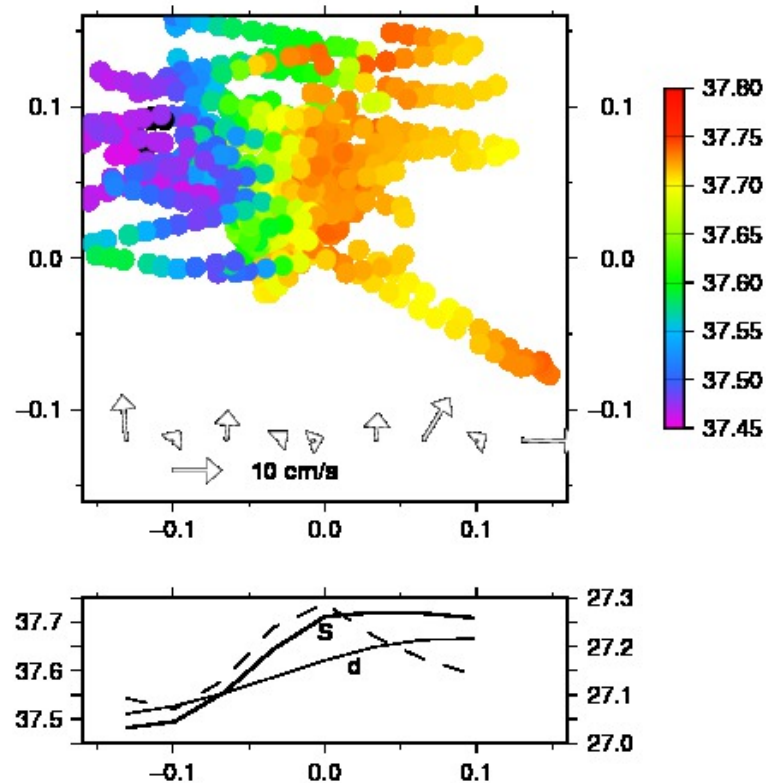
Across front scanfish survey  
South of site 1 (27/08)

Site 2 in filament drifting quickly southward. Drifters near sharp west edge of filament in current maximum

TSG station2 30/08-03/09 2012

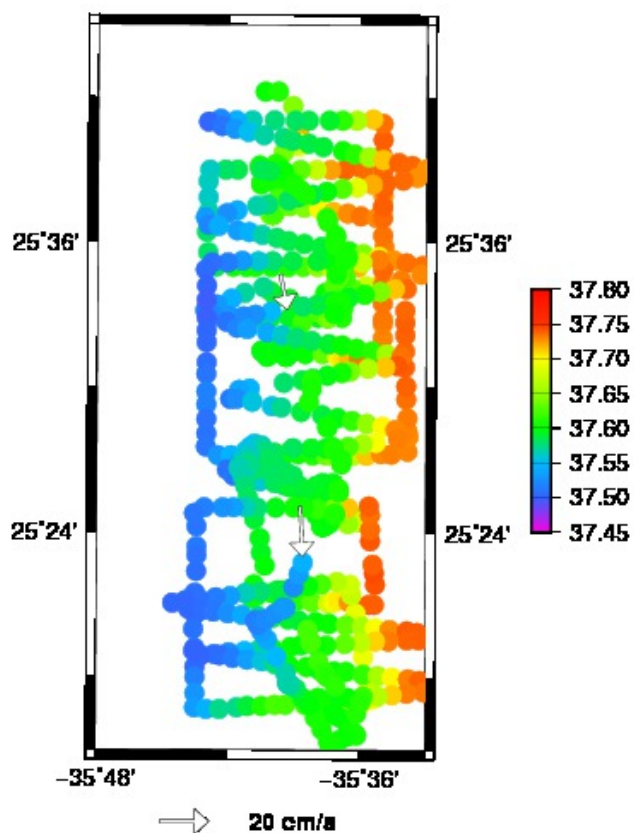


TSG Thalassa 31/08-03/09 2012

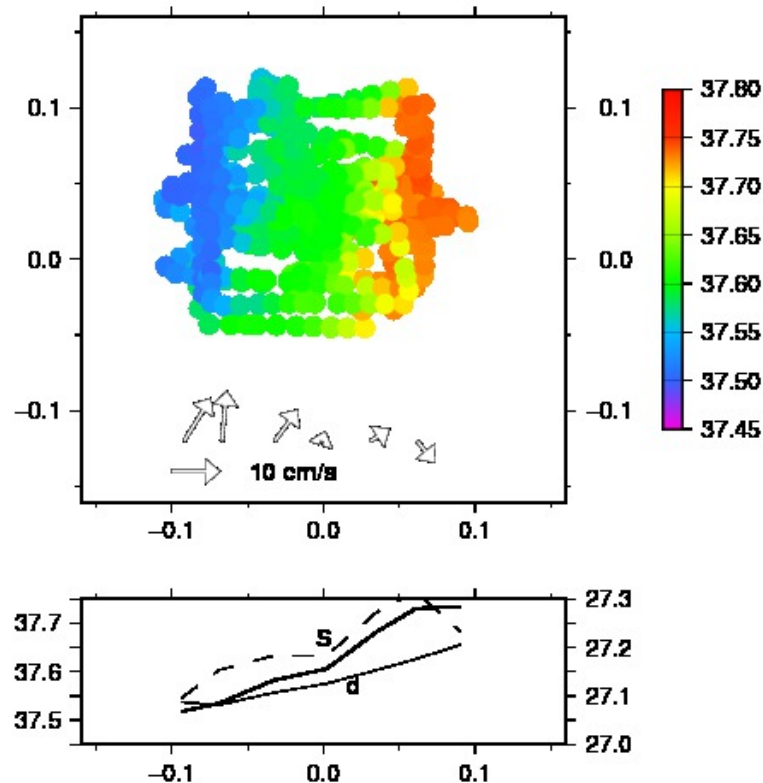


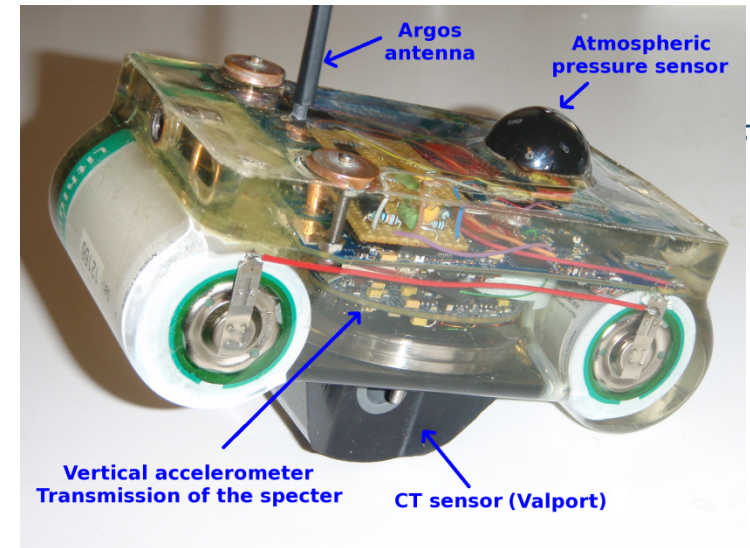
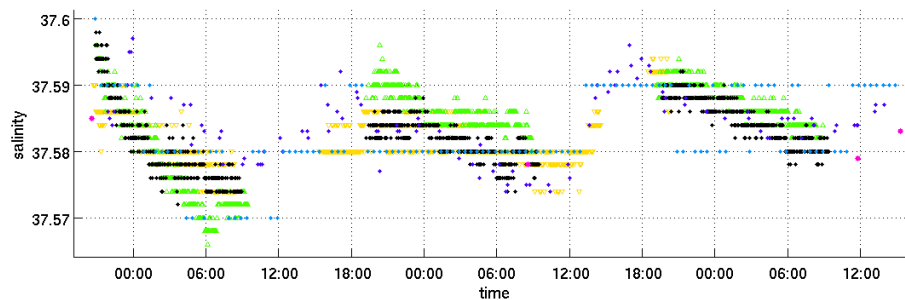
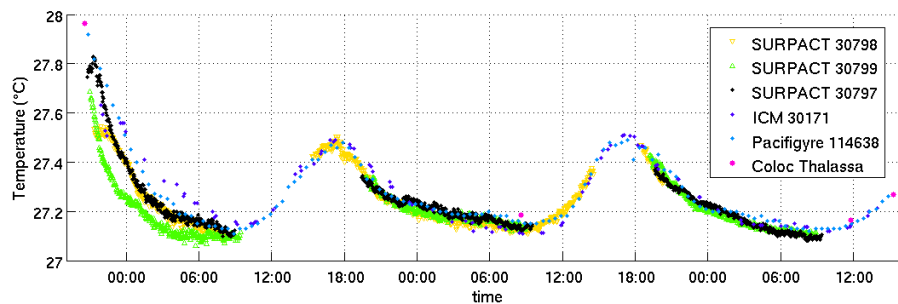
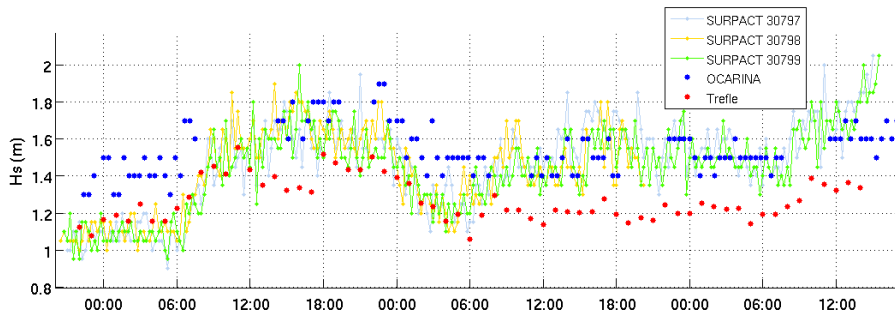
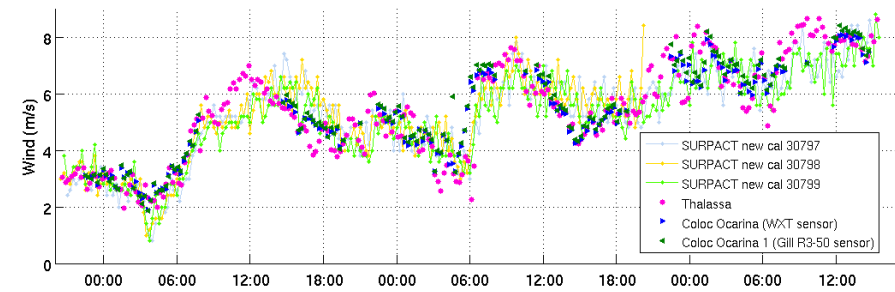
Site 3 in the gradient to the west of filament, moving quickly southward: sheared environment

TSG station3 3-6/09 2012

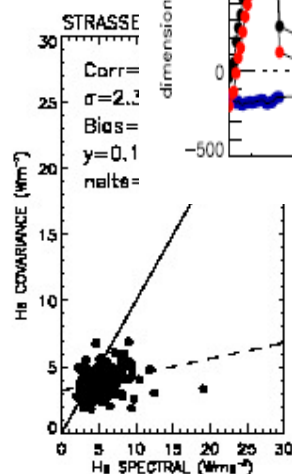
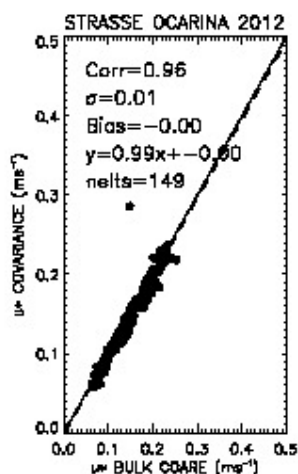
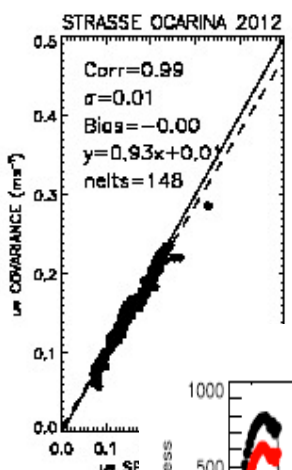
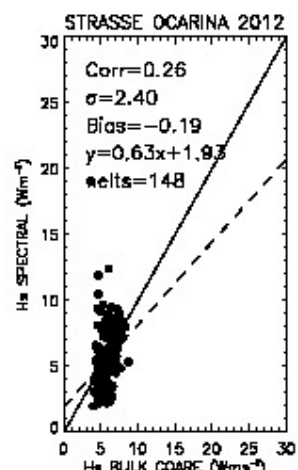
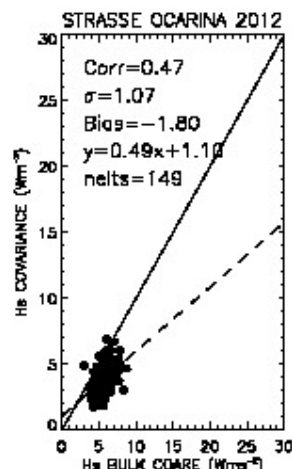
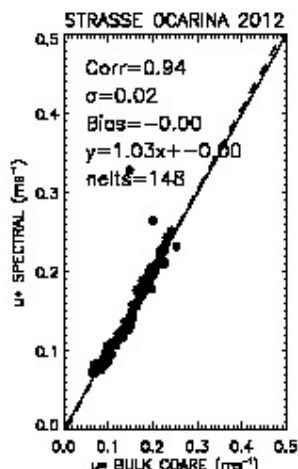
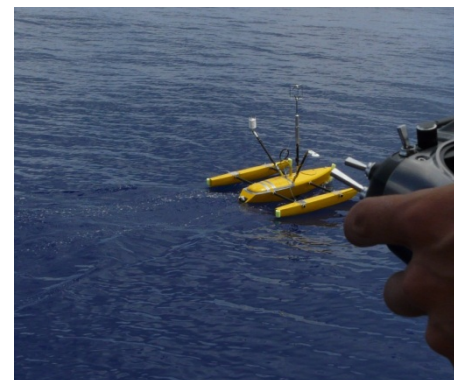


TSG Thalassa 03-06/09 2012

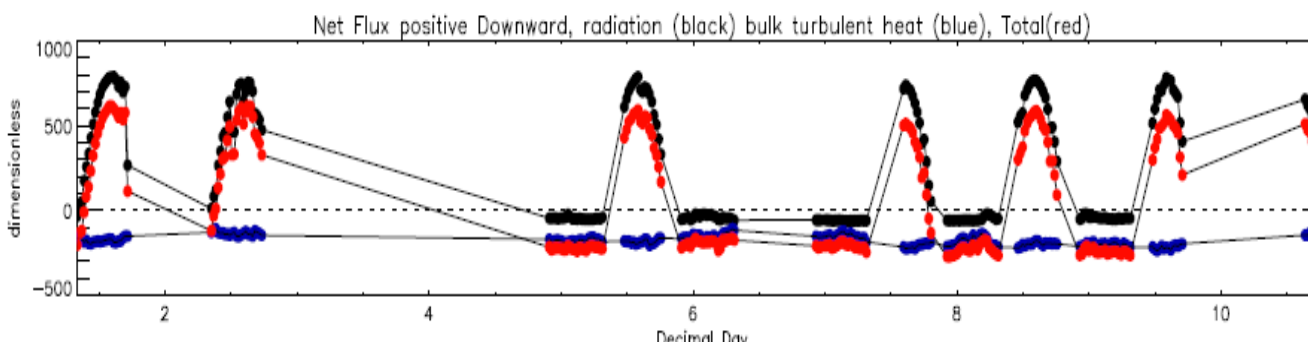




Site 4 with little hor. Gradients  
 (0.02 psu over 15 km)  
 Diurnal cycle in SSS  
 (also seen on site 3)

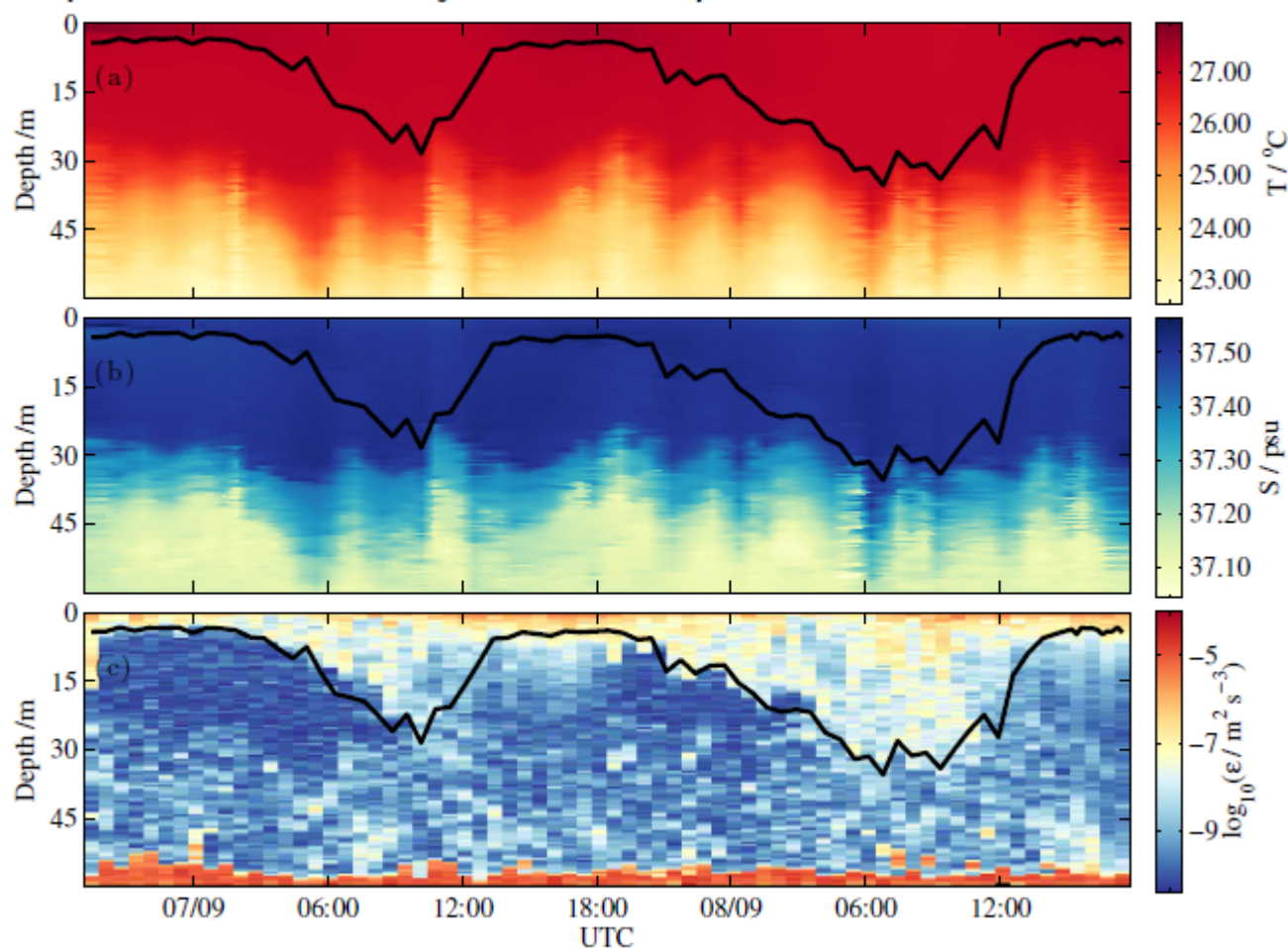


**Ocarina –derived air-sea fluxes**  
 (turbulent/parameterized for momentum  
 Sensible heat; parameterized  
 for latent heat)



# ASIP Deployment 7 (site 4)

## Temperature, Salinity and Dissipation

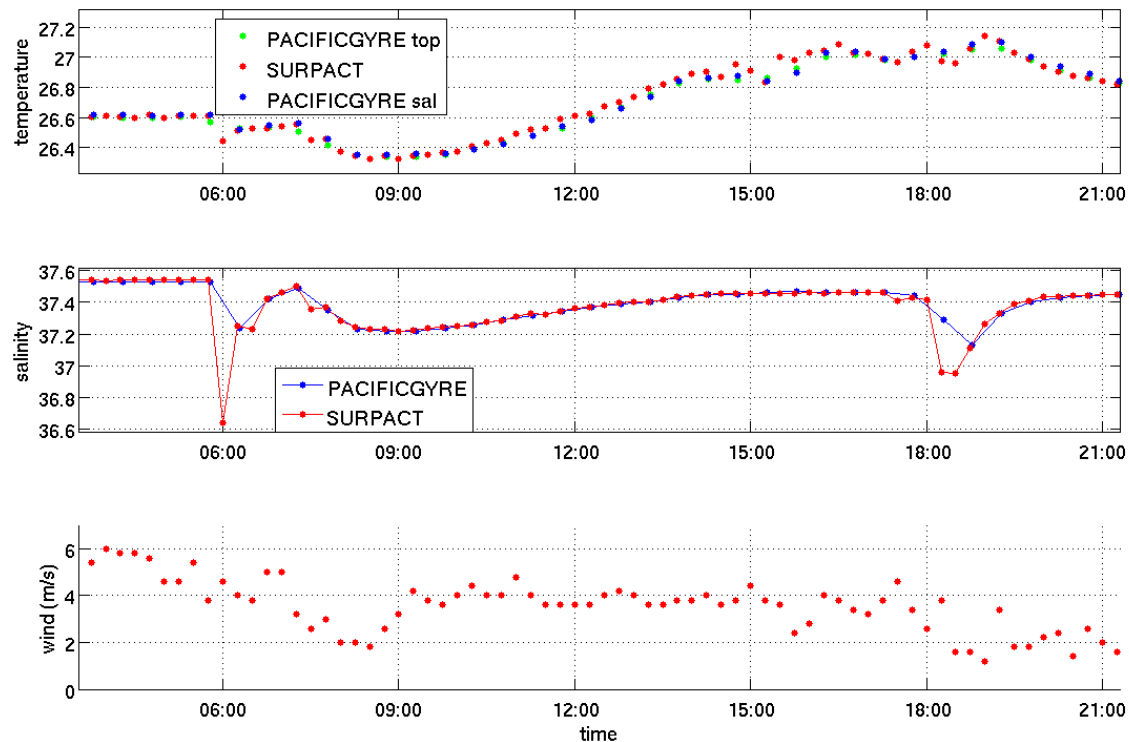


# Questions & Perspectives



- Meso-scale not very well resolved by altimetry/products, but the salty mushroom-like meso-scale feature and the fresh water advected from the north were present (and probably related to horizontal stirring (see also, example of June 2006))
  - + Effort to improve altimetric retrieved currents (+ SST)
  - . What causes the salty filament to develop in north-south from an initially slanted structure ? Complex vertical S structure.
  - + re-analyze the meso-scale survey (ADCP, TSG), drifters, gliders
  - The structures sampled during sites did not evolve much in 2-3 days. Stability? (all relevant scales explored?)
  - + evaluate S+T budget for the four sites, including daily cycle.
- Respective contributions of vertical mixing/evaporation. Estimate relative advection (sites 2 and 3)

- Not much precipitations during surveys
- (as expected)
- Precipitation events seen during later drifter data (114638/30798) (6 clear events so far; here on 29/09)

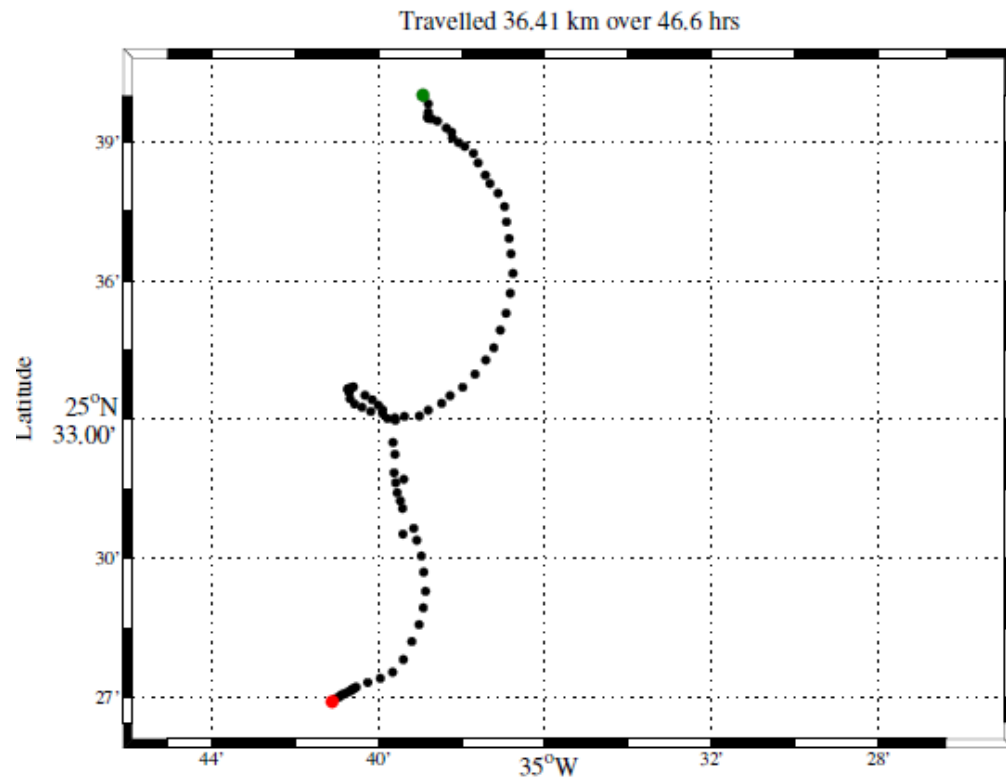
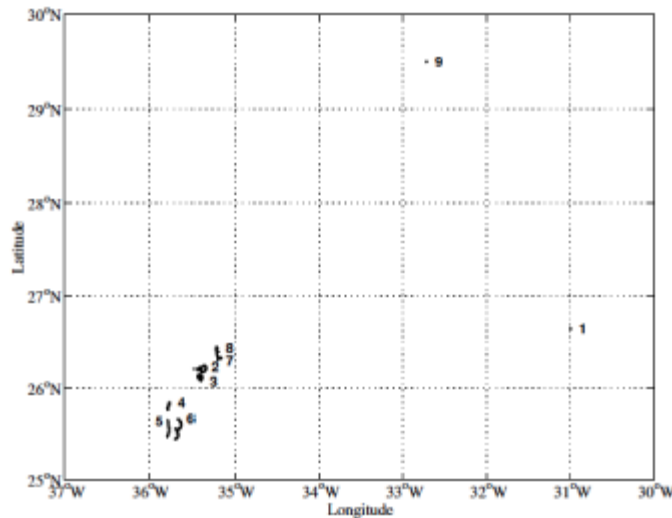


ASIP (9 deployments, 4 of which close to 48 hours; 567 profiles)

Deplt 6 during site 3:

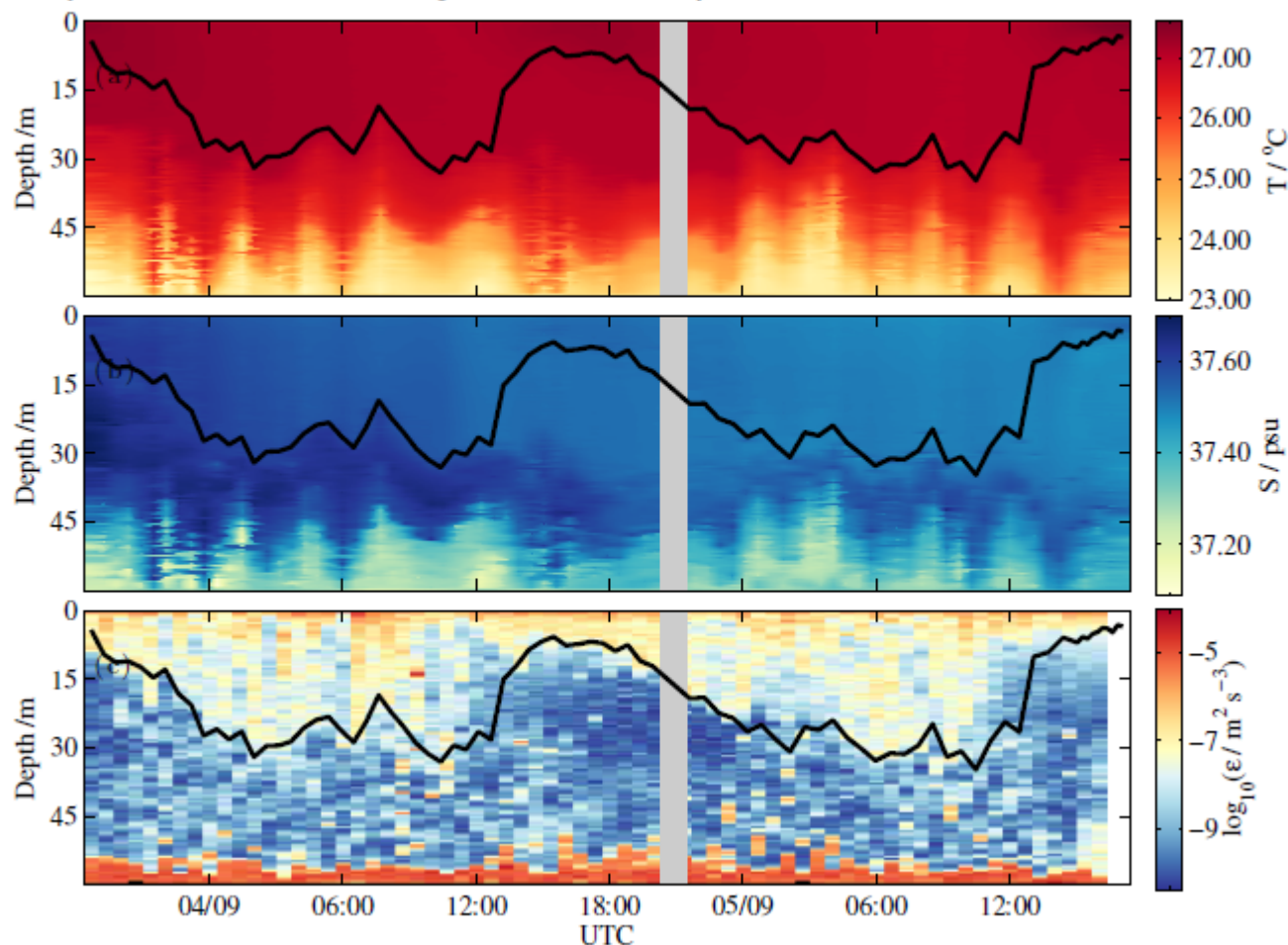
speed up to 40 cm/s (a few position errors); relative velocity downwind with respect to SVP drifters

Deployment 6



# T, S, dissipation; S still with problems

## Temperature, Salinity and Dissipation

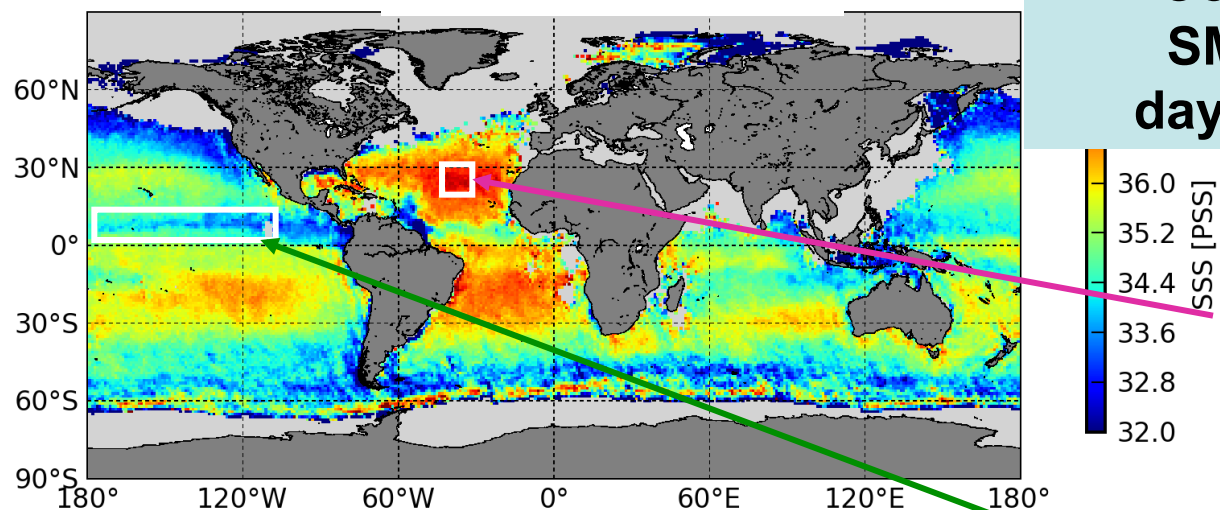


# SMOS SSS - July 2010



L1 & L2 v500 Ascending swaths (center swath,  $3\text{m/s} < \text{WS} < 12\text{m/s}$ )

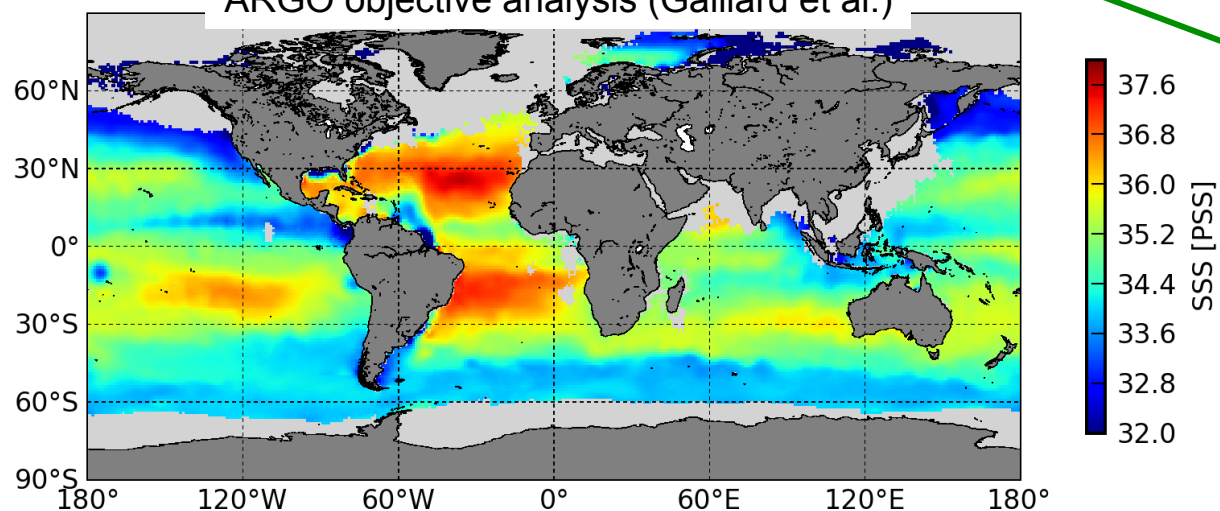
SMOS SSS



**Comparison with ARGO:  
SMOS averaged over 10  
days-100km around ARGO**

**Subtropical Atl N (SPURS region)**  
 $\text{SSS}_{\text{smos}} - \text{SSS}_{\text{argo}} = 0.04 \pm 0.22$   
**N=76**

ARGO objective analysis (Gaillard et al.)



**ITCZ trop Pac N**  
 $\text{SSS}_{\text{smos}} - \text{SSS}_{\text{argo}} = -0.05 \pm 0.40$   
**N=248**



TSG sections across central NASTG show 100 km or less variations

